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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,566	07/10/2003	David G. Luenberger	LUB-101	3757

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EXAMINER	
WONG, ERIC TAK WAI	

ART UNIT	PAPER NUMBER
3693	

MAIL DATE	DELIVERY MODE
07/22/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/618,566	LUENBERGER, DAVID G.	
	Examiner	Art Unit	
	ERIC T. WONG	3693	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) *21-26* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5 and 7-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/10/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed 12/19/2003 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Election/Restrictions

2. Claims 21-26 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention. Election was made **without** traverse in the reply filed on 4/22/2008.

Request for Information

3. Examiner has attached a request for information to the Office action. It is evident from the specification that what Applicant may regard as his invention is pricing a financial derivative of a non-marketed variable by replacing *r* in the conventional Black-Scholes equation with the coefficient recited in claim 4 (see page 5, paragraph 2). In the interest of advancing prosecution, Examiner suggests providing a new claim which is essentially the same as the current claim 4, with the difference being the new claim depending on claim 6 rather than claim 1.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1-20 rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

For purposes of § 101, a "process" has been given a specialized, limited meaning by the courts. Based on Supreme Court precedent and recent Federal Circuit decisions, a process must (1) be tied to another statutory class (such as a particular apparatus) or (2) transform underlying subject matter (such as an article or materials) to a different state or thing. If neither of these requirements is met by the claim, the method is not a patent eligible process under § 101 since it is directed to non-statutory subject matter. In addition to being tied to another statutory class, the claim should positively recite the other statutory class to which it is tied, for example by identifying the apparatus that accomplishes the method steps, or positively recite the subject matter that is being transformed, for example by identifying the material that is being changed to a different state. See Diamond v. Diehr, 450 U.S. 175, 184 (1981); Parker v. Flook, 437 U.S. 584, 588 n.9 (1978); Gottschalk v. Benson, 409 U.S. 63, 70 (1972); Cochrane v. Deener, 94 U.S. 780, 787-88 (1876). The claimed processes are not tied to another statutory class nor do they transform underlying subject matter to a different state or thing. The recitation of "a computer-implemented method" in the abstract is a nominal recitation since the abstract does not limit the scope of the claim. Thus, the processes are not patent eligible under § 101.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3, 7-20 rejected under 35 U.S.C. 102(b) as being anticipated by Schwartz ("Rational Pricing of Internet Companies").

Regarding claim 1,

Schwartz teaches determining a market representative useful in determining a value of a financial derivative; retrieving information associated with a non-marketed variable and the market representative (see first column of page 64, "state variables"); calculating a solution to an equation involving a price of the financial derivative defined as a function of the non-marketed variable and time, wherein the equation comprises a coefficient involving the information associated with the non-marketed variable and the market representative (see equations (14) and (15)).

Regarding claim 2,

Schwartz teaches wherein the information associated with the non-marketed variable and the market representative comprises a drift rate of the non-marketed variable and a drift rate of the market representative (see continuous-time model).

Regarding claim 3,

Schwartz teaches wherein the information associated with the non-marketed variable and the market representative comprises variances of the non-marketed variable and the market representative, and a covariance between the non-marketed variable and the market representative (see page 70, column 1).

Regarding claim 7,

Schwartz teaches wherein the equation is a discrete-time equation involving $V(x_e, t)$ defined as a function of x_e and discrete time points $t = k$ (see page 64, discrete version of the model).

Regarding claim 8,

Schwartz teaches wherein the market representative comprises a marketed asset or combination of such assets that is approximately most correlated with the non-marketed variable (see page 65).

Regarding claim 9,

Schwartz teaches wherein the market representative comprises a combination of multiple marketed assets associated with market sectors most closely associated with the non-marketed variable (see page 65).

Regarding claim 10,

Schwartz teaches wherein the market representative comprises a marketed asset or combination of such assets that is approximately equal to an overall market portfolio (see page 65).

Regarding claim 11,

Schwartz teaches calculating an optimal hedge (see page 70 "determining share value" through page 73 "extensions").

Regarding claim 12,

Schwartz teaches calculating a minimum variance of the error between an optimal hedge and the calculated price of the financial derivative (see page 70).

Regarding claim 13,

Schwartz teaches wherein the equation represents a risk-neutral discounted expected value of cash flows of the financial derivative (see page 73, "extensions").

Regarding claim 14,

Schwartz teaches wherein a cash flow of the financial derivative is path-dependent (see page 73, "extensions").

Regarding claim 15,

Schwartz teaches applying the method of claim 1 to derivatives of a set of non-marketed variables wherein the market representative comprises a combination of multiple marketed assets, each most-correlated with a different non-marketed variable in the set of non-marketed variables (see first column of page 64, "state variables").

Regarding claim 16,

Schwartz teaches wherein the calculated price of the financial derivative includes cash flows at an intermediate time and a terminal time, (see page 64, equations (14) and (15)).

Regarding claim 17,

Schwartz teaches wherein drift rates, an interest rate, variances, and covariances of the non-marketed variable and the market representative either vary with time or are governed by stochastic processes (see second column of page 62, second column of page 69).

Regarding claim 18,

Schwartz teaches wherein the cash flow depends on marketed variables as well as non-marketed variables (see first column of page 64, "state variables").

Regarding claim 19,

Schwartz teaches wherein the equation involves additional non-marketed variables (see first column of page 64, "state variables").

Regarding claim 20,

Schwartz teaches wherein the market representative is derived from a combination of multiple marketed variables, and wherein the market representative and the multiple marketed variables are governed by either geometric Brownian motion or alternative processes (see second column of page 62, second column of page 69).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 5 and 6 rejected under 35 U.S.C. 103(a) as being unpatentable over Schwartz in view of Applicant admission of prior art.

Regarding claim 5,

Schwartz does not teach wherein the equation is a modified Black-Scholes equation. Applicant admission of prior art teaches modified Black-Scholes equation (see page 3, paragraph 4 of specification). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Schwartz to include a modified Black-Scholes equation. One skilled in the art would have been motivated to make the modification because the Black-Scholes equation is a standard way of pricing derivatives.

Regarding claim 6,

Schwartz does not teach wherein the modified Black-Scholes equation is obtained from a standard Black-Scholes equation by replacing, in a term involving a first-order partial derivative of $V(x_e, t)$ with respect to x_e, a coefficient *r*, representing an interest rate, by a coefficient involving the information associated with x_e and x_m. As discussed above, applicant admission of prior art teaches modified Black-Scholes equations (see page 3, paragraph 4 of specification. Examiner notes that a coefficient involving the information associated with x_e and

x_m may very well be an interest rate. Therefore, the conventional Black-Scholes equation reads on the claim.

7. Claim 4 rejected under 35 U.S.C. 103(a) as being unpatentable over Schwartz in view of Official Notice.

Regarding claim 4,

Schwartz teaches using the information regarding the drift rates of x_e and x_m, interest rate *r*, and a factor derived from a variance of x_m, and a covariance between x_m and x_e in deriving the continuous and discrete versions of the model (see page 64, correlation may be derived from covariance). Schwartz does not explicitly teach a coefficient of the form $\mu_e - \beta_{em}$ $(\mu_m - r)$. Official Notice is taken that deriving a coefficient out of known elements was old and well known in the art. It would have been obvious to modify the equation of Schwartz to include deriving a coefficient with the information regarding the drift rates of x_e and x_m, interest rate *r*, and a factor derived from a variance of x_m, and a covariance between x_m and x_e since it is merely mathematical manipulation of the known elements. One skilled in the art would have been motivated to make the modification in order to factor in the differences between the market representative and the non-marketed variable.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIC T. WONG whose telephone number is 571-270-3405. The examiner can normally be reached on Monday-Friday 9:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James A. Kramer can be reached on 571-272-6783. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/James A. Kramer/
Supervisory Patent Examiner, Art Unit 3693

ERIC T. WONG
Examiner
Art Unit 3693

July 15, 2008